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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/262,912	03/05/1999	TAPANI VUORINEN	30-497	1188
23117	7590	01/03/2006	EXAMINER	
NIXON & VANDERHYE, PC			HUG, ERIC J	
901 NORTH GLEBE ROAD, 11TH FLOOR			ART UNIT	
ARLINGTON, VA 22203			PAPER NUMBER	

1731

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

This office action is a follow-up to the decision of the Pre-Appeal Brief conference held on December 18, 2005. Claims 21, 22, 25, 27-29, 32-35, and 37-41 are pending.

#### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 21, 22, 25, 27-29, 32-35, and 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henricson (WO 97/15713) in view of Chang et al (WO 91/05909).

Henricson teaches a method of bleaching cellulose pulps using a chlorine-free bleaching sequence, wherein the pulp is subject to an acid treatment (A) within one of the bleaching stages. In particular, the acid treatment can be effected in a chlorine dioxide stage (D) with the object of reducing the consumption of chlorine dioxide in the bleaching step. The method is further characterized in that cellulose pulp is acid treated at a temperature of about 75-130 degrees C and at a pH of about 2-5 to remove at least about 30% of the hexenuronic acid groups in the cellulose pulp and to decrease the kappa number of the pulp by 2-9 units. Such removal of hexenuronic acids results in significant savings in the consumption of bleaching chemicals, such as chlorine dioxide. Among the possible bleaching sequences following digestion and oxygen delignification (O) are an AD stage which comprises an acid step A and a chlorine dioxide step D. The AD may alternatively be performed in the order DA. The optimization of treatment conditions such as pH or temperature may be facilitated by using a two or more successive acid towers instead of a single tower. This also makes it possible to act on the treatment conditions by adding chemicals

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advantageous for the treatment, such as chelating agents (Q) to remove metals from the pulp and further reduce the consumption of bleaching chemicals. Thus, Henricson teaches that it is advantageous to utilize AD or DA for reduced consumption of chlorine dioxide. Bleaching and acid adjusting steps in inlet lines and/or towers and/or outlet lines is taught by Henricson.

Chang teaches a two-step, high/low pH bleaching process which includes bleaching pulp in a first chlorine dioxide bleaching step for a time of 5 minutes at a temperature of 85°C at a pH maintained between 6.0 and 7.5, then bleaching in a second bleaching step at reduced pH of 1.9 to 4.2 for 120 minutes or more. The second bleaching step may be performed in the presence of acid which is added after the first bleaching step to lower the pH to the desired level.

Alternatively, the second bleaching step may comprise a second chlorine dioxide step wherein the overall dosage of chlorine dioxide is split between the high pH bleaching step and the low pH bleaching step. This particular two-step high/low pH bleaching is performed without any acid addition or with only a small addition relative to that required in the high/low bleaching utilizing acid. A primary result of the two-step high/low pH bleaching process is a substantial reduction of chlorine dioxide usage overall. Note that Chang teaches that it is preferred to delignify the pulp prior to the bleaching sequence, such as by oxygen delignification.

In summary, Henricson teaches acid addition before chlorine dioxide treatment (AD) or after chlorine dioxide treatment (DA) to reduce the consumption of chlorine dioxide. Chang teaches acid addition after chlorine dioxide treatment (also DA) and further teaches split addition of chlorine dioxide (DD), both to reduce consumption of chlorine dioxide. One skilled in the art would be motivated to combine acid addition before chlorine dioxide addition, acid addition after chlorine dioxide addition, and split chlorine dioxide addition to further improve the reduction of

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chemical usage. The only possible combination of steps to meet each condition would be the claimed DAD bleaching sequence, thereby obtaining the combined benefits of treating the pulp with acid before chlorine dioxide, treating the pulp with acid after chlorine dioxide, and splitting chlorine dioxide addition, each contributing incrementally to reduced chlorine dioxide usage.

Note that Chang explicitly teaches by example dosages of chlorine dioxide that falls within the claimed ranges. Any differences in the exact claimed conditions of time and dosages of chlorine dioxide bleaching, none are felt to exist, would have been obvious to one skilled in the art to optimize to obtain the desired level of bleaching with minimal chemical usage.

### ***Response to Arguments***

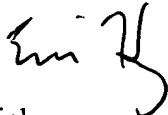
Applicant's arguments of November 23, 2005 have been fully considered. The rejections under 35 U.S.C. 103(a) over Vuorinen et al (WO 96/12063) in view of Chang et al (WO 91/05909), with or without supporting references, set forth previously have all been withdrawn. A new grounds of rejection has been set forth above.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 571 272-1192. The examiner can normally be reached on Monday through Friday, 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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